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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/343, 736	06/30/99	SPEAR	D 3600.100

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QM01/0608

EXAMINER
VERDIER, CART UNIT
3745PAPER NUMBER
//

DATE MAILED:

06/08/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

5500630-0527660

Office Action Summary	Application No.	Applicant(s)	
	09/343,736	SPEAR ET AL.	
	Examiner Christopher Verdier	Art Unit 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 4-11-01, 5-30-01.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-43 is/are pending in the application.

5) 4a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) Claim(s) 1-9, 27-29 and 36-42 is/are allowed.

7) Claim(s) 10, 11, 13-15, 18, 20-22, 30 and 43 is/are rejected.

8) Claim(s) 12, 16, 17, 19, 23-26 and 31-35 is/are objected to.

9) Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are objected to by the Examiner.

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) Notice of References Cited (PTO-892)

16) Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.

18) Interview Summary (PTO-413) Paper No(s). 11.

19) Notice of Informal Patent Application (PTO-152)

20) Other:

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Applicants' Amendments dated April 11, 2001 and May 30, 2001 have been carefully considered but are deemed non-persuasive. Claims 1-43 are pending. During a brief personal interview on May 30, 2001 between the undersigned and David Quinlan, Attorney of Record, newly added claims 42-43 were presented for consideration. During the interview, the examiner noted that a cursory review of the claims indicated that the claims would be entered. Upon further careful consideration, claim 43 contains indefinite claim language as set forth later below.

Claims 4-19 and 21-41 have been amended to overcome the rejections under 35 U.S.C. 112, second paragraph set forth in the first Office action. Newly presented claim 42 is definite. Correction of the above matters is appreciated.

Applicants' arguments that Cox defines over claims 10, 12, 13-14, 15/10, 15/12, 15/13, 15/14, 20, 24-26, and 36-37, because figure 10B of Cox is actually a rear elevation of the blade, while the side elevation view of figure 10D shows the leading edge configuration are agreed with. It is noted by the examiner that Cox does not disclose the blade configuration in each of independent claims 10, 20, and 36, because the leading edge does not show such configurations. With regard to the affidavit filed under 37 CFR 1.132 dated April 11, 2001, it is agreed that the affidavit correctly states that the side elevation view of figure 10D, not figure 10B of Cox shows the leading edge configuration. The other issues pertaining to Cox addressed in the affidavit filed under 37 CFR 1.132 dated April 11, 2001 are moot in view of Applicants' above arguments.

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Applicants' arguments that claim 30, as amended, defines over Szydlowski are persuasive, because Szydlowski does not disclose that the leading edge rear swept middle region has a sweep angle that does not decrease throughout the middle region. With regard to the affidavit filed under 37 CFR 1.132 dated April 11, 2001, the issues pertaining to Szydlowski addressed therein are moot in view of Applicants' above arguments.

Applicants' arguments that claims 10-11, 13-14, 15/10, 15/11, 15/13, 15/14, 18, 20-22, and 30 define over Hull parallel the arguments set forth in the affidavit under 37 CFR 1.132 filed of April 11, 2001 and are addressed below.

Affidavit

The affidavit under 37 CFR 1.132 filed of April 11, 2001 is insufficient to overcome the rejection of claims 10-11, 13-14, 15/10, 15/11, 15/13, 15/14, 18, 20-22, and 30 based upon Hull as set forth in the last Office action for the following reasons: Pages 2-3 of the abovementioned affidavit state that the term "sweep" when used to define a property of the leading edge of a turbomachinery blade has a precise definition to one skilled in this art. Pages 2-3 set forth the definition of the term "sweep angle" as set forth in the specification. Paragraph six of the affidavit states that the sweep angle of a blade leading edge is defined in terms of the velocity vector of the airflow approaching the blade, and that it is necessary to know not only the blade geometry but also the characteristics of the flow environment in which the blade is operating in order to

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determine the sweep angle profile of the blade's leading edge. Paragraph six concludes by stating that without knowing the flow conditions and the exact geometry of the blade, it is impossible to determine the leading edge sweep angle. Paragraphs seven through eight state that Hull contains no disclosure that one of ordinary skill in the art would interpret as suggesting that the leading edge of the disclosed blade has any particular sweep angle profile. Paragraph nine states that those skilled in the art would know that sweep angle cannot be determined without information about the blade's exact configuration and the flow characteristics of its flow environment and that one skilled in the art would immediately recognize that the simple pictorial representations of Hull are insufficient alone to impart information regarding the leading edge sweep angle profile, due to its dependence on the three dimensional relationship of the velocity vector to the blade leading edge.

These statements are not persuasive because the terms "sweep angle" and "swept" as they relate to a blade leading edge have become to be known in the turbomachinery art, in the simplest case, as a blade with a leading edge having a region which is non-parallel to a tangent to the leading edge at the region in question. That is, a leading edge region having a forward or rearward axial offset from the leading edge would be considered to have a "sweep angle" or be "swept". Although the examiner is not disputing the Applicants' provided definition of "sweep angle", through common usage in the art the term "sweep angle" has become commonly known to include a blade with a leading edge having a region which is non-parallel to a tangent to the

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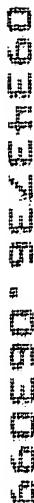
leading edge at the region in question, or a leading edge region having a forward or rearward axial offset from the leading edge. The terminology in a pending application's claims is to be given its broadest reasonable interpretation (In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989)) and limitations from a pending application's specification will not be read into the claims (Sjolund v. Musland, 847 F.2d 1573, 1581-82, 6 USPQ2d 2020, 2027 (Fed. Cir. 1989)).

In this case, one of ordinary skill in the art would readily recognize that the blade of Hull has an

intermediate region sweep angle which is adjacent reference numeral 2 and opposite region 2b in figure 2 of Hull because the intermediate region is swept to the right and axially offset from the leading edge region. One of ordinary skill in the art would clearly recognize, from simple geometry and by sighting the sweep angle in figure 2 of Hull, that the sweep angle does not decrease from the inward boundary of the intermediate region to the outward boundary (near line C in figure 2) of the intermediate region, that throughout the tip region (region 2c in figure 2) the sweep angle is less than the sweep angle at the outward boundary of the intermediate region, that the intermediate region is swept rearward (to the right), and that the tip is translated forward relative to a leading edge with the same sweep angle as the outward boundary of the intermediate region. One of ordinary skill in the art would clearly recognize, from simple geometry and by sighting the sweep angle in figure 2 of Hull, that the tip region sweep angle decreases throughout the tip region, the intermediate region sweep angle increases throughout the intermediate region, an inward boundary of the intermediate region coincides with a root end of the blade, that the intermediate region is swept rearward at a sweep angle that does not decrease from an inward

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boundary of the intermediate region to the outward boundary of the intermediate region, that throughout the tip region the sweep angle of each blade is less than the sweep angle at the outward boundary of the intermediate region, and that the rear swept middle region of the leading edge has a sweep angle that does not decrease throughout the middle region and ending at the tip region that is translated forward relative to a leading edge with the same sweep angle as the end of the middle region.



Applicants should note that anticipation by a prior art reference does not require either the inventive concept of the claimed subject matter or the recognition of inherent properties that may be possessed by the prior art reference. See, Verdegaal Bros. Inc. v. Union Oil Co., 814 F.2d 628, 633, 2 USPQ2d 1051, 1054 (Fed. Cir), cert. denied, 484 U.S. 827 (1987). A prior art reference anticipates the subject matter of a claim when the reference discloses every feature of the claimed invention, either explicitly or inherently (see, In re Paulsen, 30 F.3d 1475, 1478-1479, 31 USPQ2d 1671, 1675 (Fed. Cir. 1994), In re Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990), Hazani v. Int'l Trade Comm'n, 126 F.3d 1473, 1477, 44 USPQ2d 1358, 1361 (Fed. Cir. 1997) and RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984)). Moreover, a reference anticipates a claim if it discloses the claimed invention such that a skilled artisan could take its teachings in combination with his own knowledge of the particular art and be in possession of the invention. In re Graves, 69 F.3d 1147, 1152, 36 USPQ2d 1697, 1701 (Fed. Cir. 1995), cert. denied, 116 S. Ct. 1362

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(1966), quoting from In re LeGrice, 301 F.2d 929, 936, 133 USPQ 365, 372 (CCPA 1962). It is submitted that a skilled artisan would readily recognize the various sweep angles set forth in the preceding paragraph.

Paragraphs ten and eleven of Applicants' affidavit illustrate various entrance and exit angles of Hull and state that it is apparent from figure 4 of Hull and Applicants' figure 4 that the entrance and exit angles are not the same as the sweep angle of the present invention. These statements are not persuasive for the reasons set forth above, namely that the airfoil of Hull meets the commonly known definition of "sweep angle" known in the art. Paragraphs twelve and sixteen of the affidavit state that Applicants' specification notes that the sweep angles shown in figure 2 therein are actually projections of the actual sweep angle onto the plane of the drawings, and that a direct comparison cannot be made between Hull's figure 2 and the blade side view in the Applicants' figure 2. These statements are not persuasive for the reasons set forth above, namely that the airfoil of Hull meets the commonly known definition of "sweep angle" known in the art, and it is submitted that one of ordinary skill in the art would clearly recognize from the side view of figure 2 of Hull the abovementioned sweep angles and relationships.

Paragraph seventeen of the affidavit states that the blade shown in Hull is a turbine blade, while Applicants' figure 2 depicts a fan blade, and that while not all of Applicants' claims are limited to fan blades, persons skilled in the art understand that a side elevation of a turbine bucket

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does not necessarily impart information about the sweep angle of the bucket's leading edge in the same manner as such a view of a fan blade. This argument is not persuasive for the reasons set forth above. In addition, note that the term "fan blade" is a quasi-intended use recitation, and that a turbine blade is capable of use as a fan blade. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Lastly, the affidavit states that it is unclear what portions of the bucket the Office action considers the intermediate (middle) and tip portions. It is difficult to understand why such portions are not clear, because the previous Office action pointed out that the intermediate region is generally shown as region 2b while the tip region is generally shown as region 2c in figure 2 of Hull. These regions basically correspond to the regions 70 and 74, respectively, in Applicants' figure 2. These regions are within the tolerances that one of ordinary skill in the art would consider as the intermediate and tip regions. Note, however, that one of ordinary skill in the art would recognize that these are not specific fixed locations on the span of the airfoil, but rather are subject to a certain degree of variation.

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In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of non-anticipation fails to outweigh the evidence of anticipation.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 43 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 43, lines 2-3 recite that the projection of the tip end of each blade onto a radial plane is substantially parallel to the inner all of the casing in longitudinal cross-section. The term “substantially parallel” is indefinite. It is established patent law that the claims must define the metes and bounds of the invention with a reasonable degree of certainty. In re Venezia, 530 F.2d 956, 958, 189 USPQ 149, 151 (CCPA 1976). When a word of degree such as “substantially” is used in a claim, it must be determined whether the underlying specification provides some standard or guideline for measuring that degree, such that a person of ordinary skill in the art would understand what is claimed when the claim is read in light of the specification. Seattle Box Co. V. Industrial Crating & Packing Inc., 731 F.2d 818, 826, 221 USPQ 568, 574 (Fed. Cir. 1984). A review of the specification finds no standards or guidelines in Applicants’ specification for measuring the scope of the word “substantially”. Hence, the term

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“substantially parallel” is indefinite and the metes and bounds of this term cannot be determined with a reasonable degree of certainty.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10-11, 13-14, 15/10, 15/11, 15/13, 15/14, 18, 20-22, and 30, are rejected under 35 U.S.C. 102(b) as being anticipated by Hull. Note the blade 2, the leading edge to the left in figure 2, with the intermediate region near 2b, the tip region near 2c, with the intermediate region sweep angle not decreasing from the beginning to the outward boundary of the intermediate region, with the sweep angle throughout the tip being less than the sweep angle at the outward boundary of the intermediate region. The intermediate region is swept rearward, and the tip is considered to be swept forward. The tip region angle decreases throughout the tip region. The intermediate region sweep angle increases throughout the intermediate region.

Allowable Subject Matter

Claims 1-9, 27-29, and 36-42 are allowed.

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Claims 12, 16-17, 19, 23-26, and 31-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 43 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the

base claim and any intervening claims.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Verdier whose telephone number is (703) 308-2638. The examiner can normally be reached on Monday-Friday from 9:00 a.m. to 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look, can be reached on (703) 308-1044. The fax phone number for this Group is (703) 305-3588.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.



Christopher Verdier
Primary Examiner
Art Unit 3745

CV
June 1, 2001